

WHAT IS CLAIMED IS:

- 1 1. A method for memory failure recovery, comprising:
  - 2 maintaining a predetermined number of duplicate and primary processes;
  - 3 keeping the processes in synchronization;
  - 4 managing the processes so that a single process image is presented to an
  - 5 external environment;
  - 6 detecting a computer system exception which affects one of the processes; and
  - 7 terminating the affected process.
- 1 2. The method of claim 1 wherein the detecting element includes detecting a
- 2 memory failure.
- 1 3. The method of claim 1 further comprising:
  - 2 allocating a new memory space to each of the duplicate processes, which is
  - 3 separate from a memory space allocated to the primary process.
- 1 4. The method of claim 1 wherein the maintaining element includes:
  - 2 identifying a primary process;
  - 3 monitoring a fault-tolerance value corresponding to the primary process; and
  - 4 setting a number of duplicate processes equal to the fault-tolerance value.
  - 5
- 1 5. The method of claim 4 wherein the monitoring element includes assigning a
- 2 predetermined fault-tolerance value to a primary process.

1 6. The method of claim 4 wherein the monitoring element includes dynamically  
2 modifying the fault-tolerance value of the primary process, in response to a computer  
3 command.

1 7. The method of claim 4 wherein the setting element includes adding a new  
2 duplicate processes, if the number of duplicate processes is less than the fault-  
3 tolerance value.

1 8. The method of claim 4 wherein the setting element includes deleting a  
2 duplicate process, if the number of duplicate processes is more than the fault-  
3 tolerance value.

1 9. The method of claim 1 wherein the keeping element includes synchronizing  
2 the processes upon receipt of data from an external environment.

1 10. The method of claim 1 wherein the keeping element includes synchronizing  
2 the processes upon receipt of signals from an external environment.

1 11. The method of claim 1 wherein the keeping element includes synchronizing  
2 the processes upon transmission by one of the processes to an external environment.

1 12. The method of claim 1 wherein the managing element includes permitting  
2 only one of the processes to transmit to an external environment.

1 13. The method of claim 1 wherein the managing element includes permitting  
2 only one of the processes to perform a system call to an external environment.

1 14. The method of claim 1 wherein the managing element includes permitting  
2 only one of the processes to perform a library call to an external environment.

1 15. A method for memory failure recovery, comprising:  
2 maintaining a predetermined number of duplicate and primary processes;  
3 keeping the processes in synchronization;  
4 managing the processes so that a single process image is presented to an  
5 external environment;  
6 detecting a computer system exception which affects one of the processes; and  
7 terminating the affected process;  
8 wherein the maintaining element includes,  
9 identifying a primary process;  
10 monitoring a fault-tolerance value corresponding to the primary  
11 process; and  
12 setting a number of duplicate processes equal to the fault-tolerance  
13 value; and  
14 wherein the managing element includes,  
15 permitting only one of the processes to perform a system call to an  
16 external environment.

1 16. A data structure for memory failure recovery within a computer system,  
2 comprising the fields of:  
3 a primary process field, for identifying primary processes within the computer  
4 system; and  
5 a fault-tolerance variable field, for identifying a predetermined number of  
6 duplicate processes, corresponding to the primary processes, to be maintained within  
7 the computer system.

1 17. A computer-usable medium embodying computer program code for  
2 commanding a computer to perform memory failure recovery comprising:  
3 maintaining a predetermined number of duplicate and primary processes;  
4 keeping the processes in synchronization;  
5 managing the processes so that a single process image is presented to an  
6 external environment;  
7 detecting a computer system exception which affects one of the processes; and  
8 terminating the affected process.

1 18. The medium of claim 17 wherein the detecting element includes detecting a  
2 memory failure.

1 19. The medium of claim 17 further comprising:  
2 allocating a new memory space to each of the duplicate processes, which is  
3 separate from a memory space allocated to the primary process.

1 20. The medium of claim 17 wherein the maintaining element includes:  
2 identifying a primary process;  
3 monitoring a fault-tolerance value corresponding to the primary process; and  
4 setting a number of duplicate processes equal to the fault-tolerance value.  
5

1 21. The medium of claim 1 wherein the managing element includes permitting  
2 only one of the processes to transmit to an external environment.

1 22. A system for memory failure recovery, comprising:  
2 means for maintaining a predetermined number of duplicate and primary  
3 processes;  
4 means for keeping the processes in synchronization;  
5 means for managing the processes so that a single process image is presented  
6 to an external environment;  
7 means for detecting a computer system exception which affects one of the  
8 processes; and  
9 means for terminating the affected process.

1 23. A system for memory failure recovery, comprising:  
2 a primary process memory space hosting a primary process;  
3 a duplicate process memory space hosting a duplicate process corresponding  
4 to the primary process;  
5 a synchronization buffer for keeping the duplicate process in synchronization  
6 with the primary process;  
7 a processor for generating an exception signal in response to detection of a  
8 memory failure condition which affects the primary process; and  
9 an operating system for receiving the exception signal, terminating the  
10 affected primary process, and maintaining a predetermined number of primary and  
11 duplicate processes.

1 24. The system of claim 23, further comprising:  
2 a buffer controller for permitting the processes to receive communications  
3 from an external environment while permitting only one of the processes to transmit  
4 the external environment.

1 25. The system of claim 23, wherein the exception signal is a machine check abort  
2 signal.